LOWER PASSAIC RIVER RESTORATION PROJECT

LOWER PASSAIC RIVER STUDY AREA RI/FS

WINTER 2010 FISH COMMUNITY SURVEY
ADDENDUM TO THE
QUALITY ASSURANCE PROJECT PLAN

FISH AND DECAPOD CRUSTACEAN TISSUE COLLECTION
FOR CHEMICAL ANALYSIS
AND FISH COMMUNITY SURVEY

DRAFT

January 22, 2010
Revision Number: 0
Addendum Number 1

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Acronyms

CPG	Cooperating Parties Group
CPUE	catch per unit effort
LPRSA	Lower Passaic River Study Area
QAPP	quality assurance project plan
NJDEP	New Jersey Department of Environmental Protection
NJDFW	New Jersey Division of Fish and Wildlife
NOAA	National Oceanic and Atmospheric Administration
RM	river mile
SOP	standard operating procedure
USACE	US Army Corps of Engineers
USEPA	US Environmental Protection Agency
USFWS	US Fish and Wildlife Service
Windward	Windward Environmental LLC

Introduction

This document presents an addendum to the *Lower Passaic River Restoration Project Quality Assurance Project Plan: Fish and Decapod Crustacean Tissue Collection for Chemical Analysis and Fish Community Survey* (Windward 2009), hereafter referred to as the Fish/Decapod Quality Assurance Project Plan (QAPP). The Fish/Decapod QAPP reviewed by the US Environmental Protection Agency (USEPA) and its Partner Agencies[1] and approved by USEPA on August 6, 2009, specified that three fish community surveys would be conducted; these would include a summer 2009 survey, a winter 2010 survey, and a spring 2010 survey. This document is an addendum to the Fish/Decapod QAPP, hereafter referred to as the Fish/Decapod QAPP Addendum No. 1, and describes the winter fish community survey that will be conducted to qualitatively assess the fish community in the Lower Passaic River Study Area (LPRSA) during a maximum 10-day-period in the winter months (i.e., late January and early February). Data collected will include the diversity and abundance of fish species present during the winter and their physical characteristics (i.e., weight, length, and gender [when practicable]), as well as fish health assessments (i.e., gross internal and external pathology observations) on a subset of the fish caught.

The Fish/Decapod QAPP Addendum No. 1 includes updates to worksheets and attachments relevant to the winter fish community survey; it does not include updates to those worksheets or attachments that are not relevant to the winter fish community survey effort. Applicable and updated worksheets and attachments included in this addendum are presented below:

- Worksheet No. 1 contains the title and approval pages for the addendum.
- Worksheet No. 3 provides the distribution list.
- Worksheet No. 9 provides a record of relevant communication with USEPA and the Partner Agencies.
- Worksheet No. 10 describes the specific problem definition for the winter fish community survey.
- Worksheet No. 11 provides a summary of project tasks.
- Worksheet No. 18 provides a list of proposed sampling locations.
- Attachment X provides procedures for collecting fish using traps and trotlines.

[1] The Partner Agencies include the US Army Corps of Engineers (USACE), New Jersey Department of Environmental Protection (NJDEP), New Jersey Department of Transportation, National Oceanic and Atmospheric Administration (NOAA), and the US Fish and Wildlife Service (USFWS).

QAPP Worksheet No. 1. Title and Approval Page

Addendum to the Quality Assurance Project Plan for Fish and Decapod Crustacean Tissue Collection for Chemical Analysis and Fish Community Survey

Document Title

Windward Environmental LLC (Windward)

Lead Investigative Organization

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Project Coordinators:

Signature

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QAPP Worksheet No. 1. Title and Approval Page

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Robert Law, de maximis, inc., Date
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Approval Signatures:

USEPA Project Manager
Approval Authority

Signature

Stephanie Vaughn, USEPA, Date
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USEPA Project QA Officer
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QAPP Worksheet No. 3. Distribution List

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QAPP Worksheet No. 3. Distribution List

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QAPP Worksheet No. 9. Project Scoping Session Participants Sheet

Project Name:	LPRRP Ecological and Human Health Risk Assessment
Site Name:	LPRSA
Projected Date(s) of Sampling:	January-February 2010
Site Location:	LPRSA
Project Manager:	Bill Potter/Robert Law, de maximis, inc.
Date of Session:	December 18, 2009
Scoping Session Purpose:	Conference call to discuss components of the winter fish community survey

Participants: USEPA, dmi, AECOM, Windward

Name	Affiliation	Phone No.	E-mail Address
Stephanie Vaughn	USEPA	212.637.3914	vaughn.stephanie@epa.gov
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Lisa Saban	Windward Environmental	206.812.5429	lisas@windwardenv.com

Conference Call to Discuss the Winter Fish Community Survey	
Purpose/Decisions:	A conference call between USEPA and the Cooperating Parties Group (CPG) to discuss the scope of the proposed winter fish community survey was held December 18, 2009. Based on the discussion during the call, the parties agreed to the following items: • The winter survey will be limited to a 10-day effort. • Sampling locations will be limited to a subset of locations targeted during the summer 2009 fish community survey where fish were successfully caught. • Fishing equipment will include only non-lethal methods. • The survey will be planned for late January or early February 2010 to target the time that Atlantic tomcod may be spawning in the river, but flexibility will be allowed to account for potentially hazardous winter weather conditions.

QAPP Worksheet No. 9. Project Scoping Session Participants Sheet

Project Name:	LPRRP Ecological and Human Health Risk Assessment
Site Name:	LPRSA
Projected Date(s) of Sampling:	January-February 2010
Site Location:	LPRSA
Project Manager:	Bill Potter/Robert Law, de maximis, inc.
Date of Session:	December 29, 2009, and January 4, 2010
Scoping Session Purpose:	E-mail communications between CPG and New Jersey Division of Fish and Wildlife (NJDFW)

Participants: USDFW, Windward

Name	Affiliation	Phone No.	E-mail Address
Lisa Barno	NJDFW	908.236.2118	lisa.barno@dep.state.nj.us
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E-mail Communication Regarding the Fishing Permit for the Winter Fish Community Survey	
Purpose/Decisions:	CPG contacted NJDFW via e-mail on December 29, 2009, requesting information regarding the renewal of the fishing permit prior to finalizing plans for the winter fish community survey. NJDFW responded by asking for the types of fishing equipment intended for use during the winter survey. In an e-mail, NJDFW agreed to the use of minnow traps, eel traps, box traps and trotlines but not the use of electrofishing equipment based on the rationale that the cold temperatures may lead to a serious prolonged effect, which typically results in unnecessary mortality. They agreed to get a permit in place by mid-January but emphasized they will not approve the use of electrofishing. A subsequent phone call confirmed that NJDFW does not issue permits that allow electrofishing between October 31 and late spring (the spring date is weather dependant).

QAPP Worksheet No. 10. Problem Definition

The problem to be addressed by the project:

The second of three seasonal fish community surveys will be conducted to provide qualitative data on the fish that overwinter in the LPRSA.

The environmental questions being asked:

The specific question defined for the winter fish community survey covered in this addendum is: "What species of fish are present in the LPRSA during the winter months?" The catch results will be used to qualitatively assess what fish are present in the LPRSA during the winter months. The winter fish community survey will be conducted on a more limited basis than was the summer 2009 fish community survey (i.e., fewer days, fewer locations, less fishing gear). Per agreement between USEPA and CPG, the winter fish community survey will be conducted using only non-lethal fishing methods (i.e., box traps, eel traps, minnow traps, and trotlines), and no lethal sampling techniques (e.g., gillnets) will be used. Gillnets have been found to result in unacceptably high mortality of organisms. In addition, per NJDFW policy, electrofishing permits will not be issued between October 31 and late spring because of unnecessary fish mortality associated with electrofishing during winter months. The non-lethal methods that will used are selective methods that target specific sizes and groups of fish and are not designed to catch all fish present in the river, as would be the case when using gillnets and/or electrofishing. The catch results will, therefore, have a level of uncertainty and will not be completely comparable to data collected during other field efforts that have used or will use non-specific fishing gear. In addition, these results will not permit a quantitative assessment of the entire population of fish in the LPRSA during the winter months.

The rationale for sample location and gear type:

Two locations from each 2-mile reach between River Mile (RM) 0 and RM 14 and from the 3.4-mile reach between RM 14 and RM 17.4 have been selected for sampling over a maximum 10-day period during the winter fish community survey. The specific sampling locations selected are based on trap and trotline catch results (e.g., abundance and diversity of fish) from the summer 2009 fish community survey. The selected locations have also been positioned so that a range of habitat and shoreline conditions representative of the LPRSA are included and equal numbers of sampling locations are positioned on each bank (described as "east" and "west").

The following non-lethal methods are proposed for the winter fish community survey: minnow traps, eel traps, box traps, and trotlines. Box traps will be included in the winter survey at the specific request of USEPA, which recommend their use as the preferred method for catching Atlantic tomcod, a species that may be present in the LPRSA during the winter survey. Crab traps will not be deployed during the winter fish community survey because blue crabs are not anticipated to be present in the LPRSA. However, crab traps will be deployed during the spring 2010 fish community survey to target blue crab in the freshwater zone in an

QAPP Worksheet No. 10. Problem Definition

attempt to fill a data gap from the summer 2009 fish community survey.

Per discussions between USEPA and CPG on December 18, 2009, as well as additional communications between NJDFW and CPG on December 29, 2009 (documented in Worksheet No. 9), no lethal fishing methods will be used for the winter fish community survey; only non-lethal fishing methods are included in the Fish/Decapod QAPP Addendum No. 1. Therefore, gillnets will not be used because they often result in significant mortality of fish. In addition, the deployment of gillnets in extreme cold conditions poses a significant potential health and safety risk to the field personnel who will be working on the small boats used for fish community surveys. Electrofishing will also not be used during the winter fish community survey because NJDFW as a matter of policy does not issue electrofishing permits during the time period between October 31 and late spring as a consequence of unnecessary mortality associated with this collection technique when used in cold water temperatures.

Project decision conditions:

The conditions for project decisions (i.e., those decisions that may require communication between CPG and USEPA during the field event) include the need to relocate sampling locations within the LPRSA and the need to delay or suspend sampling because of hazardous winter weather conditions. Ice conditions on the river will be reported to USPEA on a daily basis. The field sampling schedule will be flexible enough to first conduct sampling in reaches that are free of ice. The sampling vessel will be an aluminum-hulled boat with a cabin to provide the crew with some protection from the weather. A larger, open-deck aluminum pontoon boat may be used if additional space for the crew and fishing gear is necessary. The CPG will immediately suspend operations under conditions of ice formation in the river or other extreme weather and/or environmental conditions that are a threat to worker health and safety.

QAPP Worksheet No. 11. Project Quality Objectives/Systematic Planning Process Statements

What will the data be used for?
The data collected during the winter fish community survey will be used in conjunction with information from the other two surveys (i.e., the summer 2009 fish community survey and the planned late spring/early summer 2010 fish community survey) to qualitatively assess the fish community in the LPRSA. The winter survey will specifically address which fish overwinter or are otherwise present during the winter season in the LPRSA. This survey is qualitative in nature, and the data cannot be used to quantitatively compare overall catch results from one season to another (because of the limitation imposed on gear types by NJDFW (i.e., restriction on electrofishing) and the reduced deployment period (i.e., up to 10 days for this survey compared with 36 days for the summer 2009 fish community survey). These data will be used to identify the fish species present in the LPRSA in the winter months and to generate metrics on the catch per unit effort (CPUE) for the gear types used. Fish will be caught, identified by species and gender (if practicable), measured, and released, with the exception that fish retained for health evaluations will not be released. Additional gross external and internal health assessment data will be collected on up to five fish per species for which health assessment goals were not met during the summer 2009 fish community survey. The data will be compiled and managed as described in the Fish/Decapod QAPP (Windward 2009). CPUE and community metrics will be calculated and presented in a manner similar to that used to present the results from the summer 2009 fish community survey in the *Lower Passaic River Restoration Project Fish and Decapod Field Report for the Summer 2009 Field Effort* (Windward, in prep), hereafter referred to as the Summer 2009 Fish/Decapod Field Report.
What types of data are needed?
Data collected will include the diversity and abundance of fish species present during the winter and their physical characteristics (i.e., weight, length, and gender [when practicable]). Gross external and internal health assessment data will be also be collected on up to five fish per species for which health assessment goals were not met during the summer 2009 fish community survey. Gross internal and external pathology examinations will be conducted for a subset of all fish (including target and non-target species) collected during the sampling event following procedures outlined in Hunn (1988) and USGS (2002). The data use objective for these qualitative data is to assist in the interpretation of results in terms of fish population health. Table 1 presents the fish that were collected during the summer 2009 fish community survey and underwent health assessments.
Matrix
Fish community survey observations, including the identification of species, length, weight, and gender (if practicable) of individuals and the numbers of fish caught by species, will be compiled for the winter fish community survey. As described in the Fish/Decapod QAPP (Windward 2009), community survey observations for the three seasonal fish surveys will be compiled for all fish caught; fish caught during the winter fish community survey will not be retained for any further analysis, with the exception of

QAPP Worksheet No. 11. Project Quality Objectives/Systematic Planning Process Statements

fish retained for health evaluations.

How "good" do the data need to be in order to support the environmental decision?

The winter fish community survey is designed to qualitatively assess the fish community that overwinter or are otherwise present during the winter season in the LPRSA. The qualitative assessment includes the identification of fish genus and species, identification of gender (when practicable), measurement of length accurate to ±1 millimeter, and measurement of weight accurate to ±0.5 g for fish weighing less than 60 g, ±50 g for fish weighing up to 5,000 g, and ±200 g for fish weighing up to 20,000 g, depending on the scale required. The data collected will be used in conjunction with the qualitative data collected from the summer 2009 fish community survey and the third survey, which is planned for late spring/early summer of 2010.

How many data are needed?

Fish community survey observations will be compiled for the winter fish community survey, which will be the second of three seasonal surveys. A subset of 16 locations sampled during the summer 2009 fish community survey will be revisited during the winter survey for a period of up to 10 days, as specified in Worksheet No. 11 of the Fish/Decapod QAPP (Windward 2009). One of each trap type (i.e., box trap, minnow trap, eel trap, trotline) will be deployed at each proposed location. Two locations from each 2-mile reach between RM 0 to RM 14 and the 3.4-mile reach between RM 14 and RM 17.4 will be reoccupied based on the habitat and shoreline conditions of the locations and catch results from the summer 2009 fish community survey (i.e., the Summer 2009 Fish/Decapod Field Report [Windward, in prep]).

In addition, gross external and internal health assessment data will be also be collected on up to five fish per species for which health assessment goals were not met during the summer 2009 fish community survey. Gross internal and external pathology examinations will be conducted for a subset of all fish (including target and non-target species) collected during the sampling event. Table 1 presents the fish that were collected during the summer 2009 fish community survey and underwent health assessments. Results from the health examination will be recorded on the electronic Specimen Data Form which was included as Attachment C in the Fish/Decapod QAPP (Windward 2009). These data will be used to assist in the interpretation of results in terms of fish population health.

Where, when, and how should the data be collected/generated?

The selected sampling locations (and the rationale for each location) for the winter fish community survey are presented in Worksheet No. 18 of this addendum and illustrated in Figure 1. In only limited instances will proposed sampling locations be adjusted or re-located based on field conditions and *in situ* observations. Best efforts have been made to ensure that a range of habitat and shoreline conditions that are representative of the LPRSA are included in the winter fish community survey and that

QAPP Worksheet No. 11. Project Quality Objectives/Systematic Planning Process Statements

equal numbers of sampling locations are positioned on each bank (described as “east” and “west”). In addition, the catch results from the summer 2009 fish community survey have been reviewed and analyzed to ensure that locations where the greatest abundance and diversity of fish caught are included. During the summer 2009 fish community survey, sampling efforts were most successful in areas of aquatic vegetation and along shorelines with rocks, riprap, debris, or overhanging vegetation (i.e., the Summer Fish/Decapod Field Report [Windward, in prep]). Therefore, efforts have been made to include such areas in the winter fish community survey. In addition, locations thought to provide good habitat for Atlantic tomcod were considered. Atlantic tomcod are found close to shore in estuaries and freshwater tributaries, especially in areas where there are mudflats and/or aquatic vegetation. It should be noted that New Jersey tributaries may be at the southern limit of their range, and observations of Atlantic tomcod in the Passaic River are not well documented.

The following non-lethal sampling techniques will be used for the winter fish community survey: trotlines, eel traps, minnow traps, and box traps. Box traps will be included in the winter survey at the specific request of USEPA as the preferred method for catching Atlantic tomcod, a species that may be present in the LPRSA during the winter. The box traps will be deployed and retrieved using methods described in Attachment X: SOP—Fish Surveys Using Traps and Trotlines, which is included in this addendum. In addition, because fish movement and activity can be affected by the lunar phase and weather conditions, these variables will be noted during the sampling event.

As discussed between USEPA and CPG, no lethal sampling techniques (i.e., electrofishing and gillnets) will be used for the winter fish community survey. Gillnets have been found to result in unacceptably high mortality of organisms, and, per NJDFW policy, electrofishing permits will not be issued between October 31 and late spring because of unnecessary fish mortality associated with electrofishing during winter months.

Fishing techniques proposed for the winter fish community survey will be attempted up to two times and consist of the deployment of one of each type of trap and trotline at each of the two locations within each reach. Two reaches will be covered each day. Traps and trotlines will be deployed one day; retrieved, checked, and redeployed the next day; and retrieved the following day before the field crew moves on to the next reach, for a total of two attempts per location for each type of equipment. Traps will be deployed on or near shallower mudflat areas, and trotlines will be deployed perpendicular to the shore in deeper water. If necessary, trotlines may be deployed across the channel or from the bank opposite of the trap locations, in areas where there is more suitable habitat and deeper water. All changes to the proposed plan as a result of field conditions will be communicated between USEPA and CPG technical coordinators or project managers.

Who will collect and generate the data?

Windward will provide the field sampling coordination and most of the field personnel required to conduct the winter fish community survey. Windward will be supported by its contractor Aqua Surveys, Inc., as well as de maximis, inc., and AECOM

QAPP Worksheet No. 11. Project Quality Objectives/Systematic Planning Process Statements

field personnel as required.
How will the data be reported?
Updates will be communicated (e.g., via telephone conversation, e-mail) to CPG project managers and project coordinators. An electronic database that includes the coordinates for the location where each trap and trotline is deployed, as well as for each fish collected, will be maintained. The database will include the times of trap deployment and retrieval; time of fish collection; depth of collection or trap deployment; and species, length, weight, and (if determinable) gender of all individual fish collected for analysis. A data report summarizing the abundance and diversity of fish species collected will be provided within 90 working days after the completion of the winter fish community survey. A summary of lengths and weights by species and dominance by catch effort will also be presented. In addition, the report will include a map that presents the locations and corresponding information on habitat type, if available. The data report will summarize any modifications to the proposed sampling plan outlined in this QAPP addendum.
How will the data be archived?
Data records, forms, and notes, will be scanned and stored electronically in a project file. Hard copies will be archived at Windward's main office in Seattle, Washington. Similarly, the data reports will be issued and then archived electronically and as hard copies.

QAPP Worksheet No. 11. Project Quality Objectives/Systematic Planning Process Statements

Table 1. Fish collected during the summer 2009 fish community survey that underwent health assessments

Species	Scientific Name	No. of Fish that Underwent Health Assessment
American eel	*Anguilla rostrata*	5
Atlantic menhaden	*Brevoortia tyrannus*	5
Atlantic silverside	*Menidia menidia*	5
Black crappie	*Pomoxis nigromaculatus*	3
Bluegill	*Lepomis macrochirus*	5
Bluefish	*Pomatomus saltatrix*	5
Common carp	*Cyprinus carpio*	7
Gizzard shad	*Dorosoma cepedianum*	1
Goby (unspecified)	NA	5
Hogchoker	*Trinectes maculatus*	1
Northern searobin	*Prionotus carolinus*	1
Pumpkinseed	*Lepomis gibbosus*	5
Redbreast sunfish	*Lepomis auritus*	5
Satinfin shiner	*Notropis analostanus*	3
Silver perch	*Bairdiella chrysoura*	1
Smallmouth bass	*Micropterus dolomieu*	5
Spottail shiner	*Notropis hudsonius*	5
Striped bass	*Morone saxatilis*	5
Striped mullet	*Mugil cephalus*	1
Weakfish	*Cynoscion regalis*	1
White perch	*Morone americana*	1
White sucker	*Catastomus commersoni*	5
Winter flounder	*Pseudopleuronectes americanus*	3

NA – not applicable

QAPP Worksheet No. 18. Proposed Sampling Locations for the Winter Fish Community Survey

Sampling Location[a]	Easting (X)[b]	Northing (Y)[b]	Bank	Description[c]	Rationale for Sampling Location[d]
Reach 1					
LPR1A	598862	685983	East	Near RM 0.4, Kearney Point; aquatic vegetation along shoreline; depositional area characterized mostly by silt	Summer 2009 fish community survey targeted mudflat area where Atlantic silversides, goby, white perch, and Northern pipefish were caught
LPR1D	597403	690438	West	Near RM 1.25; shallow mudflat with some riprap; depositional area characterized mostly by silt	Summer 2009 fish community survey targeted mudflat area where Atlantic silversides, goby, white perch, mummichog, and American eel were caught
Reach 2					
LPR2B	596928	695100	West	Near RM 2.3; shallow mudflat between I-295 and Point-No-Point bridges; depositional area characterized mostly by silt, and silt and sand	Summer 2009 fish community survey targeted mudflat area where Atlantic silversides, white perch, and mummichog were caught
LPR2E	590126	692885	East	Near RM 3.8; vegetated shoreline; shallow mudflat area; depositional area characterized mostly by silt	Summer 2009 fish community survey targeted mudflat area where white perch and American eel were caught
Reach 3					
LPR3A	588537	692671	East	Near RM 4.75; shallow mudflat area with aquatic vegetation nearby; depositional area characterized mostly by silt and sand	Summer 2009 fish community survey targeted area where Atlantic silversides and white perch were caught; represents mudflat habitat for this reach; near summer 2009 community survey location LPR3O (using a gillnet), where an Atlantic tomcod was caught
LPR3K	584668	698342	West	Near RM 5.75; riprap and wood pilings, deeper water	Summer 2009 fish community survey location where white perch were caught; represents riprap habitat for this reach; across the river from summer 2009 fish community survey location LPR3F (using a minnow trap), where brown bullhead were caught
Reach 4					
LPR4M	585151	701600	West	Near RM 6.5; wooden bulkhead with coniferous plants and shrubs on top and several pipes that terminate at the river; depositional area characterized mostly by silt	Summer 2009 fish community survey location where American eel and white perch were caught

QAPP Worksheet No. 18. Proposed Sampling Locations for the Winter Fish Community Survey

Sampling Location[a]	Easting (X)[b]	Northing (Y)[b]	Bank	Description[c]	Rationale for Sampling Location[d]
LPR4S	588168	706783	East	Near RM 7.5; riprap, gravel, wooden bulkhead with overhanging vegetation, cement debris, silt substrate	Summer 2009 fish community survey location where white perch, carp, largemouth bass, pumpkinseed, smallmouth bass, striped bass, and white sucker were caught; represents riprap habitat for this reach
Reach 5					
LPR5J	592097	717356	East	Near RM 9.75; mud, gravel, riprap, aquatic grass, and shrubs, trees on bank	Summer 2009 fish community survey location where American eel, carp, largemouth bass, pumpkinseed, smallmouth bass, white sucker, banded killifish, bluegill, and spottail shiner were caught; has complex shoreline habitat including both mudflat and riprap
LPR5M	590284	712972	West	Between RM 8.5 and RM 9 above the confluence with the Second River; concrete wall with some overhanging vegetation; depositional area characterized mostly by silt	Summer 2009 fish community survey location where American eel, white sucker, and tessellated darter were caught
Reach 6					
LPR6A	592574	722245	East	Near RM 10.7 and the Malcolm Pirnie 2005 high-resolution core location, shallow mudflat with gravel and overhanging trees and vegetation; depositional area characterized mostly by gravel and sand and silt and sand	Summer 2009 fish community survey targeted mudflat area where American eel, pumpkinseed, smallmouth bass, white sucker, bluegill, and rock bass were caught; across the river from summer 2009 fish community survey location LPR6S (using a trotline), where brown bullhead were caught
LPR6D	595137	724114	West	Near RM 11.4 above confluence with Third River; shallow mudflat with overhanging vegetation and trees; substrate of mostly gravel and sand and silt and sand	Summer 2009 fish community survey targeted mudflat area where white perch, pumpkinseed, and tessellated darter were caught; has complex habitat and pilings
Reach 7					
LPR7D	597447	734889	East	Near RM 13.7; shallow mudflat with riprap and overhanging trees; depositional area characterized mostly by silt and sand	Summer 2009 fish community survey location where bluegill were caught; represents one of the few depositional areas in this stretch of the river that includes silt

QAPP Worksheet No. 18. Proposed Sampling Locations for the Winter Fish Community Survey

Sampling Location[a]	Easting (X)[b]	Northing (Y)[b]	Bank	Description[c]	Rationale for Sampling Location[d]
LPR7Q	596587	729111	West	Near RM 12.5; shaded with trees; rocks, large woody debris; deeper water	Summer 2009 fish community survey locations where American eel, white perch, white catfish, channel catfish, bluegill, and tessellated darter were caught
Reach 8					
LPR8D	599182	741745	West	Near RM 16.1; shallow rock and gravel substrate, riprap, overhanging trees and vegetation along shoreline; depositional area characterized mostly by gravel and sand	Summer 2009 fish community survey location where American eel, largemouth bass, and redbreast sunfish were caught; represents typical substrate and aquatic habitat for this section of the river
LPR8K	597509	737734	East	Near RM 14.2 across from the Dundee Canal; concrete wall, shallow mudflat with overhanging trees, purple loosestrife and vegetation along shoreline	Summer 2009 fish community survey location where largemouth bass, bluegill, channel catfish, and redbreast sunfish were caught

[a] Proposed sampling locations are a subset of locations sampled during the summer 2009 fish community survey where the greatest abundance and diversity of fish species were caught using non-lethal methods.

[b] New Jersey State Plane (US survey ft).

[c] The sampling location description is based on field observations from the summer 2009 fish community survey (Summer Fish/Decapod Field Report [Windward, in prep]). Substrate type is based on Malcolm Pirnie (2006).

[d] All of the primary fish receptors targeted during the summer 2009 fish community survey were caught at one or more of the locations selected for the winter fish community survey, with the exception of brown bullhead. As noted in the table, brown bullhead were caught at locations in close proximity to the proposed sampling locations LPR3K and LPR6A, although on the opposite bank of the river.

RM – river mile

QAPP Worksheet No. 21. Project Sampling SOP References Table

SOP Reference Number	Title, Revision Date and/or Number	Originating Organization	Equipment Type	Modified for Project Work? (Y/N)	Comments
11[a]	Fish Surveys, Using Traps and Trotlines. SOP (January 2010), Revision 0	Windward	Sampling vessel; trotlines; and minnow, eel, and box traps	Y	Attachment X

[a] Next sequential number in Fish/Decapod QAPP SOP reference table (Windward 2009).

QAPP – quality assurance project plan

SOP – standard operating procedure

References

Hunn JB. 1988. Field assessment of the effects of contaminants on fishes. Biological report 88(19). National Fisheries Contaminant Research Center, US Fish and Wildlife Service, Columbia, MO.

Malcolm Pirnie. 2006. Lower Passaic River Restoration Project. Draft geochemical evaluation (step 2). Prepared for US Environmental Protection Agency Region 2 and US Army Corps of Engineers. Malcolm Pirnie, Inc., White Plains, NY.

USGS. 2002. Illustrated field guide for assessing external and internal anomalies in fish. Information and technology report USGS/BRD/ITR-2002-0007 [online]. US Geological Survey, Washington, DC. Available from: http://www.cerc.usgs.gov/pubs/center/pdfDocs/ITR_2002_0007.pdf.

Windward. 2009. Lower Passaic River Restoration Project. Quality Assurance Project Plan: Fish and decapod crustacean tissue collection for chemical analysis and fish community survey. Final. Prepared for Cooperating Parties Group, Newark, New Jersey. Windward Environmental LLC, Seattle, WA.

Attachment X: SOP—Fish Surveys Using Traps and Trotlines

I. Introduction

This procedure, based on Standard Operating Procedure (SOP) 29 of FSP2 (Malcolm Pirnie et al. 2006), defines the procedures to be followed when conducting fish surveys in the Lower Passaic River Study Area (LPRSA). The fish surveys will be performed, as practicable, using baited box, eel and minnow traps, and trotlines. Although the details of fish collection will be influenced by site-specific conditions, certain aspects of the collection can be standardized for fish sampling. These procedures give descriptions of equipment, field procedures, and the documentation necessary to conduct fish population surveys. Other SOPs may be used with this SOP and are addressed in the Fish/Decapod QAPP (Windward 2009).

The SOP is not intended for use when collecting fish tissue samples. Attachment J in the Fish/Decapod QAPP (Windward 2009) provides the procedures for conducting fish surveys.

II. Preparations for Sampling

The QAPP identifies sampling stations and frequency of sampling. The field team is responsible for reviewing the QAPP prior to conducting field activities and ensuring that all field equipment are available and in acceptable condition.

III. Equipment and Supplies

Equipment to be used during fish surveys may include but is not limited to the following:

- Sampling vessel
- Box traps and bait
- Eel traps and bait
- Minnow traps and bait
- Trotlines, hooks, and bait
- Weights and buoys (or floats)
- Fish measuring board
- Scale
- Specimen Data Form
- Field guides and taxonomic keys
- Coolers, plastic buckets and/or steel washtubs
- Ziplock bags
- Waterproof marking pens
- Personal protective equipment (PPE) as required (e.g., disposable gloves, safety glasses, cold water immersion suits (e.g., Mustang suits))
- Camera

IV. Location of Sampling Stations

The position and depth of the sampling station will be established. The positioning procedures are described in QAPP Attachments G and H in the Fish/Decapod QAPP (Windward 2009): Locating Sample Points Using a Hand-Held Global Positioning System (GPS) and Locating Sample Points Using a Boat-Mounted Global Positioning System (GPS), respectively. The depth of the sampling station will be determined using either a fathometer or weighted demarcated line. Proposed sampling locations are presented on Figure 1 and summarized in Worksheet No. 18. Adjustments to additional sampling locations may be conducted in the field, based on *in situ* conditions and observations.

V. Fish Surveys

The following protocol shall be implemented, as practicable, for conducting fish surveys in the LPRSA at the appropriate sampling stations as described the QAPP Addendum.

A. Baited box, eel and minnow traps

Minnow traps are rounded and torpedo shaped, constructed of 0.25-inch galvanized, extruded steel mesh with a spring-clip closure and a 0.50-inch opening. Eel traps are similar to minnow traps except that they are longer and have a 1-inch opening. Box traps are square or rectangular in shape and made of a lightweight, welded, 0.50- by 1-inch mesh wire that has been dipped in a black polyvinyl chloride coating for added saltwater protection.

All traps are made of reinforced aluminum mesh and can be buoyed with a small flotation device. Traps will be preferentially set during the day on incoming tides to the extent possible based on the schedule of sampling activities. If sampling activities do not allow for the deployment of traps during the day, traps will be deployed in the late afternoon to early evening hours and will be retrieved the following morning in the same manner as trotlines.

Traps will use bait contained in bait bags or perforated containers to prevent the consumption of bait. Baited traps will be deployed at each of the sampling stations during the winter sampling. Fish collected in these traps will be counted and identified for the fish community survey.

Length, weight, and, if practicable, gender will be recorded for all individual fish caught during the fish community survey. When gender cannot be identified, gender will be recorded as “indeterminable.”

1. Place the bait (e.g., cheese dough, bread, bologna) into the mesh bag or on the hook attached to the center bow of the trap. Attach a float or buoy to the end of the minnow trap line.
2. Lower the trap into the water from the side of the boat, making sure that the trap is securely anchored and oriented on the river bottom. A buoy should be clearly visible on the water surface so that the minnow trap can be easily retrieved.
3. Note the time and location of deployment and retrieval and any pertinent sampling location and condition descriptions in the field logbook.
4. Retrieve traps.

5. Empty each trap into an individual clean holding container by slowly pulling the two ends of the trap apart.
6. All trapped fish will be identified, counted, weighed, and measured (total length).

B. Trotlines

Trotlines may be used to collect a variety of fish species and sizes. Each trotline will consist of a main line with baited size 4 to 6 worm hooks. Trotlines will be deployed from a boat and generally set perpendicular to the shore. To comply with federal boating regulations for navigable waterways, buoys will not be set in navigation channels. If practicable, a minimum of one trotline will be set per sampling zone. An anchor and float line will be attached to each end of the main line, and the trotline will be set overnight. Trotlines will be preferentially set during the day on incoming tides to the extent possible based on the schedule of sampling activities. If sampling activities do not allow for the deployment of trotlines during the day, they will be deployed in the late afternoon to early evening hours and will be retrieved the following morning in the same manner as the traps.

1. After baiting the hooks (with squid, clams, worms and/or chicken livers), place the trotlines into the water from the side of the boat, making sure that the line is taut from beginning to end. An attached buoy should be clearly visible on the water surface so that the trotlines can be easily retrieved.
2. Set trotlines perpendicular to the shore.
3. Note the time and location of deployment and retrieval and any pertinent sampling location and condition descriptions in field logbook.
4. Retrieve trotlines.
5. Unhook any fish caught on the trotlines into a clean holding container.
6. Fish removed from the trotlines will be identified, counted, weighed, measured (total length). Gender will be recorded, when practicable. If gender cannot be identified, it will be recorded as “indeterminable.”

VI. Fish Handling

Fish collected only for identification or population surveys should be identified in the field and released alive, when possible, after they are weighed and measured. Fish collected for health assessments will be stored in clean ziplock bags and placed on ice in a cooler for transport back to the field laboratory for examination.

VII. Reference

Malcolm Pirnie, Earth Tech, Battelle. 2006. Lower Passaic River Restoration Project. Draft field sampling plan. Volume 2. Prepared for US Environmental Protection Agency, US Army Corps of Engineers, and New Jersey Department of Transportation/Office of Maritime Resources. Malcolm Pirnie, Inc., White Plains, NY; Earth Tech, Inc., Bloomfield, NJ; Battelle, Stony Brook, NY.

Tierra Solutions. 1999. Passaic River Study Area ecological sampling plan. Work plan/field sampling plan. Volume 1 of 6. Tierra Solutions, Inc., Newark, NJ.

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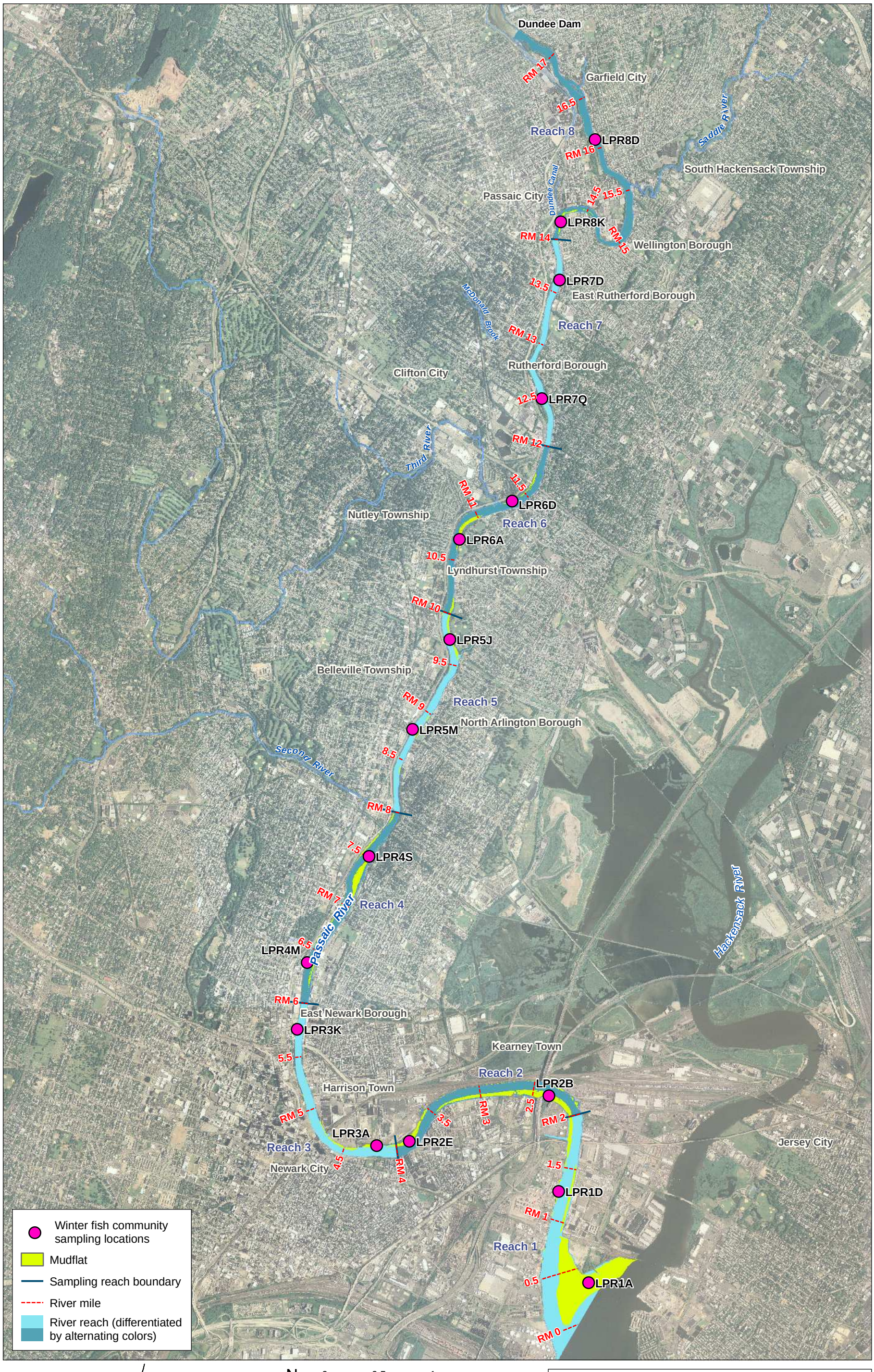
Oversize Figure



Orthophoto: USGS National Agriculture Imagery Program, August 2005

Figure 1. Proposed sampling locations for the LPRSA winter fish community survey

DRAFT

Prepared by LSM 12/22/09, CEH 01/07/10, MAP 4028; W:\Projects\06-58-01 Passaic RI\Data\GIS\Maps and Analysis\Fish\2009